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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,017	10/29/2003	Leland Swanson	TI-36333	7074
23494	7590	04/28/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			CLARK, JASMINE JHIHAN B	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	

2815

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<p>Application No.</p> <p align="center">10/696,017</p>	<p>Applicant(s)</p> <p align="center">LELAND SWANSON ET AL.</p>	
	<p>Examiner</p> <p align="center">Jasmine J. Clark</p>	<p>Art Unit</p> <p align="center">2815</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 14, 15 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-12, 14, 15 and 17-20 is/are allowed.
- 6) ☒ Claim(s) 1, 8 and 9 is/are rejected.
- 7) ☒ Claim(s) 2-7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>04/11/05</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

***Information Disclosure Statement***

1. The information disclosure statement filed 04/11/05 has been fully considered.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Schwiebert et al. (US 5,672,542).

Schwiebert shows a structure of a semiconductor device circuit (see Fig. 6C), comprising a semiconductor die (numeral is not shown. Please see Fig. 3F and column 11, line 5 for example).first plurality of electrical contacts (at the periphery area of the die) and a second plurality of electrical contacts (at the central area of the die) ; a package substrate comprising a third plurality of electrical contacts and a fourth plurality of electrical contacts; a first plurality of conductive bumps wherein at least one bump in the first plurality serves as at least a portion of a conductive path between at least one of the first plurality of electrical contacts and at least one of the third plurality of electrical contacts; a second plurality of conductive bumps, wherein at least one bump in the second plurality serves as at least a portion of a conductive path between at least one of the second plurality of electrical contacts and at least one of the fourth plurality of

electrical contacts; and wherein each of the bumps in the first plurality of conductive bumps is larger than each of the bumps in the second plurality of conductive bumps.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the reference as applied to claim 1 above, and further in view of Kumazawa et al. (US 5,569,960) and Nishiguchi et al. (US 5,214,308).

As per the above discussion, the applied reference shows in Fig. 6C, a plurality of bumps between the semiconductor die and the substrate. However, the applied reference fails to teach and/or suggest wherein the substrate comprises a package type

Art Unit: 2815

selected from the group, for example, consisting of a ball grid array. Kumuzawa teaches in column 9, the use of, for example, BGA package. It would have been obvious to practice using a package type such as BGA package, as is notoriously well known. Furthermore, the applied reference fails to teach wherein the substrate further comprises a plurality of recessed holes, where each hole adapted to receive one of the first plurality bumps. Nishiguchi shows in Fig. 7, a plurality of recessed holes where each of a plurality of bumps 2a located therein. Hence, it would have been obvious to one having ordinary skill in the art to have a plurality recessed holes on a surface of the substrate for the same reasons as taught by Nishiguchi.

***Allowable Subject Matter***

4. Claims 2-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The applied references fail to teach and/or suggest, wherein the average size of the first plurality of conductive bumps is at least 100% larger than the average size of the second plurality of conductive bumps as set forth in claim 2 and the limitations as set forth in claims 3-7.

5. Claims 10-12, 14, 15, and 17-20 are allowed.

The following is an examiner's statement of reasons for allowance: please similar reasons as discussed in paragraph 3 above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Telephone Inquiry Contacts***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jasmine J. Clark whose telephone number is (571) 272-1726. The examiner can normally be reached on Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jjbc/04/26/05

**JASMINE CLARK  
PRIMARY EXAMINER**

